

What is claimed is:

1. A semiconductor device manufacturing apparatus that uses a thermal CVD reaction to deposit a film onto a substrate, said apparatus having a power supply means that supplies electric current to said substrate or said film deposited thereupon.
2. A semiconductor device manufacturing apparatus according to claim 1, wherein said power supply means supplies said electric current to said substrate or said film deposited thereupon, either directly or indirectly.
3. A semiconductor device manufacturing apparatus according to claim 2, wherein said power supply means comprises a power supply source and a electrode terminals which is connected to said power supply source and to said substrate or said film deposited thereupon.
4. A semiconductor device manufacturing apparatus according to claim 2, wherein said power supply means further comprises a current controlling means which controls said current to be supplied to said substrate or said film deposited thereupon.
5. A semiconductor device manufacturing apparatus according to claim 1, wherein said current controlling means controls said current to be supplied to said substrate or said film deposited thereupon, either continuously or intermittently.
6. A semiconductor device manufacturing apparatus according to claim 3, wherein said electrode terminals are provided on peripheral area of either said substrate or a region on which said film being deposited on said substrate.
7. A semiconductor device manufacturing apparatus according to claim 1, wherein said electrode terminals comprises a plurality of pairs of two electrode terminal units, and each one of said pairs comprising two electrode terminal units, a first electrode terminal unit and a second electrode terminal unit which being oppositely arranged with interposing an area of said substrate on which said film will be deposited, therebetween.

8. A semiconductor device manufacturing apparatus according to claim 7, wherein said current controlling means supplies a voltage to each one of said electrode terminals pair so as to supply a voltage having a first polarity to said first electrode terminal unit of respective electrode terminal pairs and to supply a voltage having a second polarity to said second electrode terminal unit of said electrode terminal pair, oppositely arranged to said first electrode terminal unit.

9. A semiconductor device manufacturing apparatus according to claim 7, wherein said current controlling means controls said polarity of said voltage applied to each one of said electrode terminal units of said respective electrode terminal pairs so as to be varied either continuously or intermittently with respect to the time elapsing.

10. A semiconductor device manufacturing apparatus according to claim 7, wherein said current controlling means controls said polarity of said voltage applied to each one of said electrode terminal units of said respective electrode terminal pairs so that said polarity of said voltage applied to one of said electrode terminal pairs differs from that applied to separate electrode terminal pair adjacently arranged thereto, either continuously or intermittently with respect to the time elapsing.

11. A semiconductor device manufacturing apparatus according to claim 4, wherein said current controlling means controls said voltage applied to at least one of said electrode terminal units so as to change said voltage value, either continuously or intermittently with respect to the time elapsing.

12. A semiconductor device manufacturing apparatus according to claim 10, wherein said current controlling means controls said polarity of said voltage applied to each one of said electrode terminal units so as to change a direction of said current flowed through said substrate.

13. A semiconductor device manufacturing apparatus according to claim 4, wherein said current controlling means further includes a detecting means for

detecting either one of current and voltage applied to said substrate or said film deposited thereupon whereby said current controlling means controls the value of either said current or said voltage in response to a result of said detecting means.

14. A semiconductor device manufacturing apparatus according to claim 4, said apparatus further provided with a temperature controlling means for controlling the temperature of said electrode terminal units and wherein said current controlling means further includes a detecting means for detecting either one of current and voltage applied to said substrate or said film deposited thereupon whereby said temperature controlling means controls a temperature controlling means so as to change a temperature of said substrate or said film deposited thereupon, in response to a result of said detecting means.

15. A semiconductor device manufacturing apparatus according to claim 1, wherein power supply means is further provided with an electrode terminal units moving means which changes a respective position of said electrode terminal unit with respect to a main surface of said substrate or said film deposited thereupon.

16. A semiconductor device manufacturing apparatus according to claim 15, wherein said electrode terminal units moving means controls to set said electrode terminal units either at a first position at which said electrode terminal units are contacted to said substrate or said film deposited thereupon or at a second position at which said electrode terminal units are not contacted thereto.

17. A semiconductor device manufacturing apparatus according to claim 15, wherein said electrode terminal units moving means is provided with a supporting means on which said electrode terminal units are supported.

18. A semiconductor device manufacturing apparatus according to claim 2, wherein said power supply means comprises a power supply source and an non-contact electric current supplying means which is connected to said power supply

source means and supplying said current to said substrate or said film deposited thereupon, without making said current supplying means to be directly connected thereto.

19. A semiconductor device manufacturing apparatus according to claim 18, wherein said non-contact electric current applying means comprises a coil means.

20. A semiconductor device manufacturing apparatus according to claim 18, wherein said power supply means further comprises a current controlling means which controls value of said current to be applied to said non-contact electric current supplying means.

21. A semiconductor device manufacturing method for depositing a film on a substrate by a thermal CVD reaction, wherein said film is deposited on a substrate while a current is applied to said substrate or film deposited thereupon.

22. A semiconductor device manufacturing method according to claim 21, wherein said film is deposited while the potential on said substrate or film deposited thereupon is arbitrarily set.

23. A semiconductor device manufacturing method according to claim 21, wherein said film is deposited while the electric current is applied to said substrate or said film deposited thereupon, intermittently.

24. A semiconductor device manufacturing method according to claim 21, wherein said film is deposited while either one of said voltage value and said current value is varied either intermittently or continuously.

25. A semiconductor device manufacturing method according to claim 21, wherein said film is deposited while a direction of said current flowed through said substrate or said film deposited thereupon, is changed, either intermittently or continuously.

26. A semiconductor device manufacturing method according to claim 21, wherein said film is deposited while a temperature of said substrate or of said film deposited thereupon, is varied.

27. A semiconductor device manufacturing method apparatus according to claim 21, wherein either one of said voltage value and said current value is varied either intermittently or continuously.

28. A semiconductor device manufacturing method according to claim 11, wherein said film is deposited while setting the potential of said substrate or film deposited thereupon to a ground potential.

29. A semiconductor device manufacturing method for depositing a film on a substrate by a thermal CVD reaction, wherein a current or a potential is applied to said substrate or film deposited thereupon without making contact with said substrate or film deposited thereupon.

30. A semiconductor device manufacturing method according to claim 29, wherein magnetic flux is applied to said substrate or film deposited thereupon.

31. A semiconductor device manufacturing method comprising:

a step of depositing a film onto a substrate using a thermal CVD reaction and

a step of depositing a film by using a thermal CVD reaction as a current is applied to either one of said substrate and said deposited film.

32. A semiconductor device manufacturing method comprising:

a step of forming a trench on a semiconductor substrate,

a step of depositing a barrier layer for the purpose of preventing film diffusion within said trench,

a step of depositing a film onto said barrier layer by using a thermal CVD reaction,

a step of depositing a film by using a thermal CVD reaction while applying either one of a current and a voltage to either one of said substrate and said deposited film, and

a step of polishing said film and said barrier layer, so as to leave said film and barrier layer within said trench, so as to form a wire.